

# Questions

- What is loose coupling?
- What is a Dependency?
- What is IOC (Inversion of Control)?
- What is Dependency Injection?
- Can you give few examples of Dependency Injection?
- What is Auto Wiring?

# Tight Coupling

```
public class TodoBusinessService {  
    TodoDataServiceImpl dataService = new TodoDataServiceImpl();  
  
    public class ComplexAlgorithmImpl {  
        BubbleSortAlgorithm bubbleSortAlgorithm  
            = new BubbleSortAlgorithm();  
    }  
}
```

# Loose Coupling

```
@Component
public class TodoBusinessService {

    @Autowired
    TodoDataService dataService; // = new TodoDataService()

    public TodoBusinessService(TodoDataService dataService) {
        this.dataService = dataService;
    }
}

public interface TodoDataService {
    List<String> retrieveTodos(String user);
}
```

# Loose Coupling

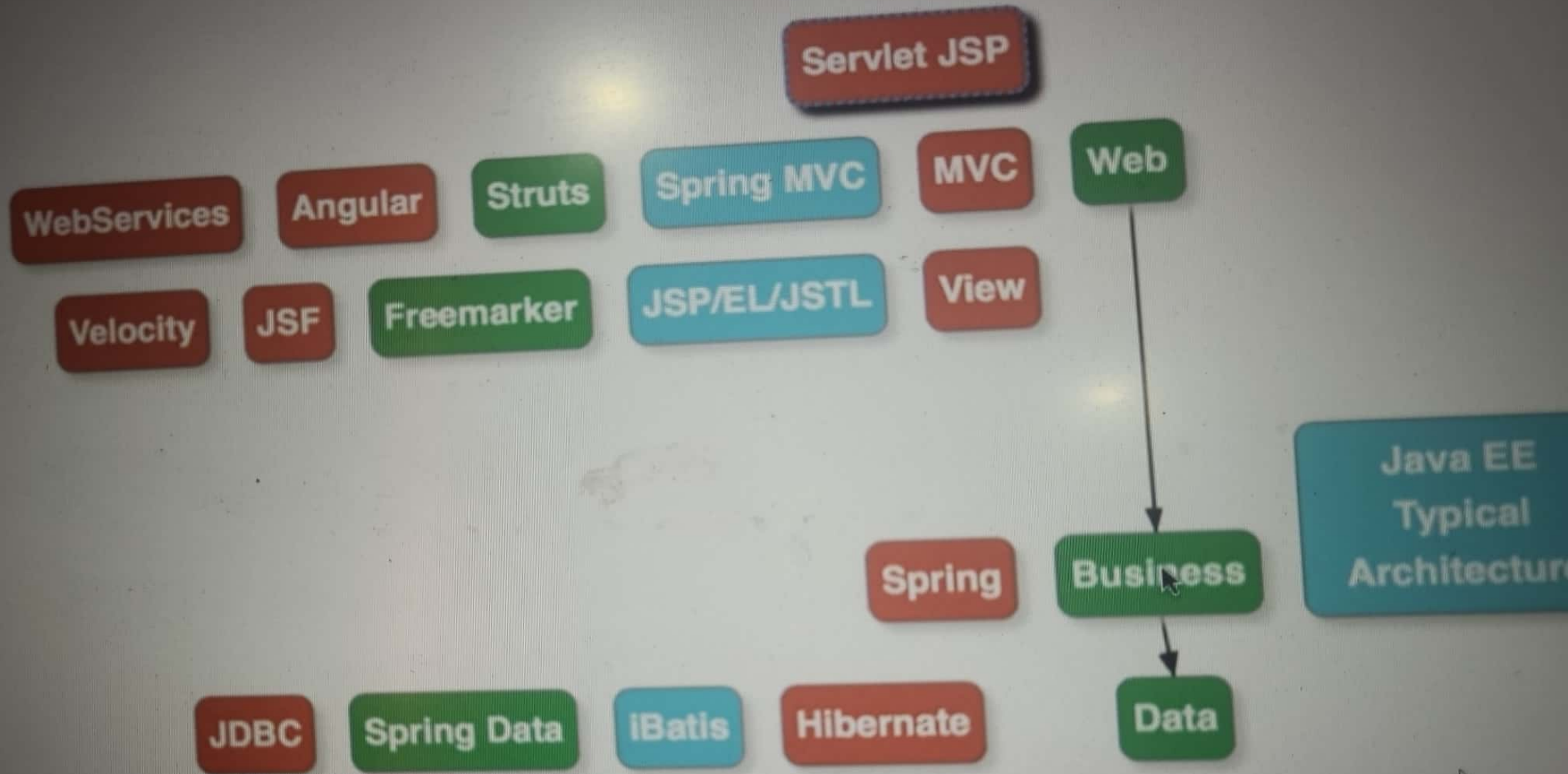
```
@Component
public class ComplexAlgorithmImpl {

    @Autowired
    private SortAlgorithm sortAlgorithm;

    public interface SortAlgorithm {
        public int[] sort(int[] numbers);
    }

    public class QuickSortAlgorithm implements SortAlgorithm {

    public class BubbleSortAlgorithm implements SortAlgorithm {
```





# Dependency Injection

- We use Spring Framework to instantiate beans and wire dependencies

```
ComplexAlgorithmImpl binarySearch =  
    new ComplexAlgorithmImpl(new QuickSortAlgorithm());
```

```
@Component  
public class ComplexAlgorithmImpl {  
  
    @Autowired  
    private SortAlgorithm sortAlgorithm;
```

# Inversion of Control

```
public class ComplexAlgorithmImpl {  
    BubbleSortAlgorithm bubbleSortAlgorithm  
        = new BubbleSortAlgorithm();  
}
```

```
@Component  
public class ComplexAlgorithmImpl {  
  
    @Autowired  
    private SortAlgorithm sortAlgorithm;  
}
```